

REMARKS/ARGUMENTS

Claims 1, 3 – 5, 11 – 15 and 21 – 34 are submitted for examination.

Claims 2, 6 – 10 and 16 – 20 are cancelled.

Claims 28 – 32 and 34 have been allowed.

Claims 1 – 5, 11 – 15, 21 – 27 and 33, as originally presented, were rejected under 35 USC §103(a) as being unpatentable over US Patent 4,290,486 to J.A. Regalbuto in view of US Patent 4,352,397 to G.B. Christopher.

The Regalbuto patent discloses an explosive pipe or tubing cutter construction wherein high explosive elements of the of the construction are combined as an independent sub-assembly. The Regalbuto explosive sub-assembly comprises a plurality of explosive wafers 66/72 stacked serially between a pair of end plates 24/46. The end plates are mechanically secured to respective distal ends of a “fuse tube” 32 that projects through apertures in the explosive wafers. The only electrically initiated detonator in the Regalbuto disclosure is the detonator 114 secured within the housing end plug 106. The electrical detonator 114 ignites the fuse detonators 96/98. Responsively, the fuse detonators 96/98 ignite the fuses 102/104. Explosive detonators 40/54 are mechanically secured within the respective end plate structures 24/46. Respective fuses 102/104 are attached to the detonators 40/54 **before** the explosive sub-assembly is inserted into the bore space of a cylindrical housing 12.

The cylinder bore space of the Regalbuto housing 12 is selectively closed at one end by a threaded end-plug 106. The opposite end of the Regalbuto housing bore is closed by a welded end plug 18. Since the end plug 18 is secured and sealed by welding, the plug 18 is necessarily attached to the housing cylinder body 12 **before** the explosive sub-assembly is inserted. Once the explosive sub-assembly of Regalbuto is inserted into the housing bore space, the welded plug 18 end of the assembly is inaccessible. Hence, the fused detonator 40 must be attached to the explosive assembly **prior** to insertion of the explosive into the housing bore space. The detonator fuses 102/104 of Regalbuto are connected to fuse the detonators 96/98 **after** the explosive assembly is inserted into the bore space.

The Christopher patent discloses an incendiary torch type of pipe or tubing cutter. **The Christopher disclosure expressly distinguishes his “incendiary torch” from an “explosive charge” cutter at column 1, lines 32 – 47.** With this important distinction being made, a plurality of annular, combustion gas generating fuel pellets 82 are serially loaded into the heat resistant cylinder liner 74 between a thin aluminum retainer 85 and a heat resistant plug 76. Since the “fuel pellets” 82 of Christopher are not explosive material, there are no detonators associated with the “fuel pellets”. The “fuel pellet” material of Christopher is ignited along a central bore column by a “powdered non-gas forming pyrotechnic fuel composition 83”. The retainer 85 holds the powdered, non-gas forming fuel 83 within the central bore column of the “fuel pellets”. Christopher column 4, line 63 – 65. The powdered fuel 83 within the “fuel pellet” bore column is ignited by a jet of extremely hot combustion gas generated by the decomposition of pyrotechnic fuel pellets 62 and 64. Ignition of the powdered fuel 83, in turn, ignites the gas forming “fuel pellets” 82 to generate a radial discharge of pipe cutting jet streams channeled through a multiplicity of nozzles 88. An externally surrounding pipe is “cut” by this multiplicity of hot gas streams in a manner similar to a cutting torch.

As a further observation of the Christopher disclosure, independent of the Christopher housing sleeve 32, no structural unity between the heat resistant cylinder liner 74 and the several “fuel pellets” 82 is disclosed. Although Christopher devotes little descriptive effort to this facet of the disclosure, by all appearances these elements of the Christopher are only loosely associated by a mutual confinement within the liner 74. Evidently, the “fuel pellets” of Christopher are loaded through the end of the housing sleeve 32 that is closed by the plugs 76 and 20. Although the “fuel pellets” 82 may be inserted in the liner 74 prior to loading in the sleeve 32, there is absolutely no assurance that the unused assembly could be removed from the sleeve as a unit. Since Christopher teaches no mechanism to extract the “fuel pellets” 82 from the housing sleeve 32 other than gravity, the “fuel pellets” are free to fall independently from within the liner 74. If the entire assembly is inverted, with the plugs 76 and 20 removed, the sleeve and pellets 82 may fall out of the sleeve 32 as a singular unit, or – they **may not**. No structure in the assembly or the disclosure is

suggested to assure that result.

Applicant's **claimed** invention (Amended claim 1) is directed to an apparatus for severing a length of pipe comprising three essential characteristics: (1) a tubular housing having a barrel extending between opposite distal ends, (2) an electrically initiated explosive detonation means at opposite distal ends of the housing barrel, and (3) a plurality of high explosive pellets assembled separate from the housing and **structurally** bound together as a **singular, independent unit without detonation means** for insertion into and extraction from said barrel as a single unit.

Definitively, the apparatus of claim 1 comprises the combination of two, structurally independent units: 1) the housing unit and 2) the explosive unit. Exclusively, the explosive detonators are described as an integral element of the housing unit. The explosive unit is expressly described as having no detonators.

This combination is a novel characteristic of Applicant's invention that permits the housing to be constructed and primed prior to transport from a remote assembly plant. The only electrical connection that must be made at the well site is to the wire-line conductor.

The explosive unit is the assembly of numerous, small value, explosive pellets that may be safely transported as separate packages. At or near the well site, a precisely prescribed number of the pellets may be structurally combined as a singular unit. This structural combination of pellets is performed independently of the housing to verify the correct explosive value and a correct alignment relationship between the pellets prior to combination with the primed housing. Notably, the assembly of high explosive pellets has no proximate detonation means until actual and final insertion into the housing barrel.

The claim 1 definition of Applicant's invention differs in numerous small respects from the disclosure of Regalbuto. The most significant difference, however, is the Regalbuto structural combination of detonators and explosive pellets prior to the housing assembly.

The Christopher disclosure of a **fuel** cutter that is flame ignited from a separate fuel source is of such distant technology from the present **explosive** cutter

technology as to justify a **non-analogous prior art** characterization. The Christopher liner 74 does not structurally unify explosive pellets. Moreover, the Christopher liner 74 does not structurally unify the Christopher fuel pellets separate and independent of the housing.

Applicant's method claim 11 describes the invention terms of a structurally independent explosive unit that is assembled separate from the barrel tube. Distinctively, the explosive unit is primed by translational movement of the explosive unit into the barrel to engage a resiliently biased detonator. Nothing from the disclosures of Regalbuto or Christopher could be construed to suggest the construction method of claim 11.

Applicant's independent apparatus claim 21 is directed to his novel cutter housing construction that connects two detonators in the housing for engaging opposite ends of an explosive column. Distinctively, one of the two detonators is secured to a housing end closure.

The Regalbuto patent describes a detonator 114 secured to a removable housing plug 106. Regalbuto also describes detonators 96/98 secured to a closure plate 86. However, neither of the Regalbuto detonators 96/98 or 114 engage an explosive column. Conversely, neither of the Regalbuto detonators 40 or 54 that do engage an explosive column may be characterized as secured to a selectively removed housing end closure that environmentally seals one end of the housing.

Applicant's independent apparatus claims 25 and 27 further distinguish the invention characteristics of claim 21 by specifying an electrical continuity between the explosive detonators that is sustained during displacement of the barrel end-caps. Although the end-cap detonator 114 of Regalbuto is electrically initiated, detonator 114 does not engage the explosive column. Those Regalbuto fuse initiated detonators 40 and 54 that do engage the explosive are not electrically initiated and have no electrical continuity between them. Significantly, Applicant's invention eliminates the necessity electrically connecting detonators under environmental

conditions that are oftentimes stressful. With Applicant's invention, the detonators may be secured within the housing at the housing construction site. No field connection of internal wiring is necessary.

Independent method claim 33 has been amended by describing the assembly of high explosive pellets as a singular, structural unit. Notwithstanding the present amendment, the previous presentation of claim 33 described the method of "engaging a first detonation means" by an explosive column "as it is deposited" into a tubular barrel. These phrases of method claim 33 describe a dynamic series of events. The disclosures of neither Regalbuto nor Christopher may credibly be interpreted to describe the event of detonator engagement by an explosive column as a consequence of transferring (moving) the explosive column into a tube barrel.

Also present in the previous presentation of claim 33 is that patentably novel characteristic of Applicant's invention concerning an uninterrupted electrical continuity between the detonators as the explosive column is inserted in the tube barrel. This description could have no relevance to prior art such as Regalbuto or Christopher which have no electrically initiated detonators engaging the high explosive.

Applicant is appreciative of the Examiner's allowance of claims 28 – 32 and 34. By such allowance, the Examiner has indicated his recognition of those patentably novel aspects of Applicant's invention.

In view of the present amendments and arguments presented herewith to distinguish Applicant's claimed invention over the cited prior art, Applicant respectfully requests the Examiner's favorable reconsideration and allowance of all remaining claims as patentably novel over the prior art.

Date: March 9, 2005

Respectfully Submitted,

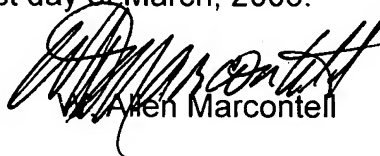


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